



DC FAN LIFE EXPERIMENT REPORT

Available for these models with lower speed and same physical structure. All model may be followed byRxx orFxx series suffixes. This test report applies to THD 240x240x100.0mm series as the right table				
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Representative Test P/N : THD2348MU-00DXT

Equipment: 1.Oven: E24-T0161 On/Off Cycles: Every 500 hours

⊙ **L₁₀ Expectancy: 70,000 hours minimum @ fan rated voltage and the temperature of 40°C**

According to the equation for **Weibull distribution**, **MTTF ≙ 7×L10 = 490,000 hours**

And we rely on a zero failure Weibull test strategy and accelerated testing technique, to determine the total test time (t) for verifying the above life estimation by the equations,

$$t = 1.036 \times \text{MTTF} \times [(B_{r;c}) \div n]^{0.91} \div A_F, \text{ and } A_F = 2^{(T_s - T_u)/10}$$

where, (B_{r;c}) is Poisson distribution factor with the failure number of r equal to 0 and the decimal confidence level of c equal to 0.90(90%).

Stress/Elevated Temperature Ts (°C) (Actual Test Temperature)	Unstress Temperature Tu (°C)	Acceleration Factor A _F	Quantity of Test Devices n (pcs)	Poisson Distribution Factor B _{r;c}	Required test time with zero failure t (hours)	Actual test time with zero failure t (hours)	Verified MTTF 40 °C (hours)	Verified L ₁₀ 40 °C (hours)
70	40	8.00	30	2.303	6,137	360.0	28,743	4,106

Test Progress:

Date for Test Beginning	Date for Test Termination (at least)	Current Test Status			Current Total Test Time (hours)
2018/8/13 11:00 AM	2019/4/30 5:14 PM	<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination	360.0

Herewith , we could assume as right on the basis of above test result. Besides, if the actual test time exceed the required, it comes out that those fans' L₁₀ expectancy and MTTF are greater than the warrant. (**MTTF** : means Mean Time To Failures, it should be used in a non-repairable system setting. Now we show the MTTF in our life report, that's because we will not repair the failed fans during life experiment. **MTBF**: means Mean Time Between failures, it should be used in a repairable system setting.

Temperature for MTTF Estimation (°C)	Acceleration Factor A _F	Estimated MTTF (hours)	Estimated L ₁₀ (hours)
25	22.63	81,296	11,614
30	16.00	57,485	8,212
40	8.00	28,743	4,106
50	4.00	14,371	2,053
60	2.00	7,186	1,027
70	1.00	3,593	513

- Fan permission criteria for the measurement after test :
1. Speed can not drop of ≥ 15% below the original measured rpm.
 2. Current cannot increase > 15% of original measure current.
 3. Noise cannot >3dB over the original measure noise.

Test Result	<input checked="" type="checkbox"/> Accept <input type="checkbox"/> Reject
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QE File No.	Time-out for function test or others (hours)	Issued Date	Reported By	Approved By
DG18FNL085	109.00	2018/9/2	Loly.Wang	Tim.Yi

BGN (dBA) : 16.3

Temp (°C) : 21.2



DC FAN FUNCTION TEST RECORD FOR LIFE EXPERIMENT

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Required Test Time (hrs)		Date for Test Beginning		Date for Test Termination		Sample Size (pcs):	Failure (pcs):	Current Total Test Time (hrs)	
6,137		2018/8/13 11:00 AM		2019/4/30 5:14 PM		30	0	360.0	
Representative Test P/N : THD2348MU-00DXT				Current Test Status			<input checked="" type="checkbox"/> In process	<input type="checkbox"/> In process (exceed requested)	<input type="checkbox"/> Termination
Equipment: 1.Oven: E24-T0161							On/Off Cycles: Every 500 hours		
Test Data Between Initial Test and Final Test									
Sample No.	Initial Test Current Spec. (A) 4.79 Max.	Final Test Current Spec. (A) 4.79 Max.	Deviation (%)	Initial Test Speed Spec. (RPM) 4500-5500	Final Test Speed Spec. (RPM) 4500-5500	Deviation (%)	Initial Test Noise Spec. (dB A) 74.0 Max	Final Test Noise Spec. (dB A) 74.0 Max	Deviation 3 dBMax.
1	3.86	3.97	2.8	5025	5037	0.2	69.3	70.2	0.9
2	3.93	3.92	0.0	5042	5068	0.5	69.5	70.0	0.5
3	3.95	3.94	-0.2	5067	5033	-0.7	70.1	69.5	-0.6
4	3.81	3.94	3.3	5064	5039	-0.5	70.5	69.4	-1.1
5	3.97	3.93	-1.1	5025	5067	0.8	69.3	69.8	0.5
6	3.98	3.86	-3.0	5050	5068	0.4	69.0	69.4	0.4
7	3.87	3.81	-1.3	5069	5027	-0.8	69.6	69.3	-0.3
8	4.00	3.86	-3.5	4965	5049	1.7	69.8	69.7	-0.1
9	4.00	3.95	-1.1	4998	5067	1.4	69.3	69.8	0.5
10	3.65	3.92	7.5	4963	5069	2.1	69.7	69.5	-0.2
11	3.95	3.97	0.5	5027	5059	0.6	70.5	69.2	-1.3
12	3.96	3.93	-0.9	5074	5061	-0.3	70.6	69.7	-0.9
13	3.97	3.92	-1.3	5067	5037	-0.6	69.2	68.5	-0.7
14	4.12	4.01	-2.6	5036	5028	-0.2	69.3	69.1	-0.2
15	4.02	4.03	0.2	5012	4992	-0.4	69.8	69.0	-0.8
16	4.06	4.02	-1.1	5041	5027	-0.3	69.5	68.7	-0.8
17	3.87	3.95	2.2	5028	5061	0.7	69.3	69.5	0.2
18	3.97	3.98	0.2	5067	4998	-1.4	68.9	69.7	0.8
19	3.97	3.96	-0.3	5034	5037	0.1	68.2	69.3	1.1
20	3.95	3.87	-2.2	5050	5066	0.3	68.7	69.5	0.8
21	3.97	3.84	-3.2	4991	5037	0.9	68.5	69.1	0.6
22	3.96	3.89	-1.8	4993	5047	1.1	69.2	69.8	0.6
23	3.93	3.97	1.0	4927	5079	3.1	70.2	69.7	-0.5
24	3.97	3.94	-0.8	5064	5081	0.3	70.8	70.5	-0.3
25	4.02	3.95	-1.7	5017	5067	1.0	69.3	70.1	0.8
26	4.02	4.00	-0.6	5059	5077	0.4	69.1	69.8	0.7
27	4.01	3.96	-1.1	5067	5092	0.5	69.8	69.5	-0.3
28	3.70	3.93	6.2	5091	5061	-0.6	69.9	69.6	-0.3
29	3.96	3.98	0.6	5066	5044	-0.4	69.9	69.4	-0.5
30	3.65	3.94	7.9	5034	5039	0.1	69.4	69.0	-0.4
X-Bar	3.93	3.94	-	5033.77	5050.47	-	69.54	69.51	-
σ	0.11	0.05	-	37.84	23.15	-	0.61	0.41	-
QE File No.		Time-out for function test or others (hours)		Issued Date		Reported By		Approved By	
DG18FNL085		109.00		2018/9/2		Loly.Wang		Tim.Yi	